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Zero Retries is an independent newsletter promoting technological innovation that is occurring in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology. Now in its third year of publication, with 1600+ subscribers.

About Zero Retries

Steve Stroh N8GNJ, Editor

Jack Stroh, Late Night Assistant Editor Emeritus

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Web version of this issue - https://www.zeroretries.org/p/zero-retries-0152

Request To Send

Commentary by Editor Steve Stroh N8GNJ

Major Conference Countdowns

- **Hamvention 2024** in Xenia, Ohio, USA - ***Today through Sunday***. I look forward to highlighting any Zero Retries Interesting product reveals in next week's Zero Retries.
- **HAM RADIO 2024** in Friedrichshafen, Germany on 2024-06-28 thru 30, in *03* weeks!
- **JARL Ham Fair 2024** in Tokyo, Japan on 2024-08-24 and 25, in *14* weeks!

See other events at the Zero Retries Guide to Zero Retries Interesting Conferences.

Let's Get Some More Manuals Scanned

The Zero Retries readership is nearly 1700 subscribers, and well over 2000 when various "followers" are counted. I'd like to think that we're a progressive

bunch.

In Zero Retries 0151, Kay Savetz K6KJN said:

> Do you want more manuals like these to be scanned? We can make it happen, with your help. Internet Archive has many more pallets of unsorted manuals just waiting to be scanned. You can help get them to the scanning center. We've negotiated a situation where, if money is donated, the remaining manuals can be sent for scanning without us having to pre-sort them like we did for the first four pallets. DLARC will fund the scanning of manuals that overlap with our mission, and plenty of non-radio manuals will be scanned too. If you want to help, here is a special donation link. If you're in the U.S., donations are tax deductible.

"Amateur Radio" (the ARDC grant that funded the Digital Library of Amateur Radio & Communications) did its part in getting 4,000+ manuals (that related *in some way* to "radio" and "communications") scanned and online. If you're curious from the great "Manuals Plus" rescue, you can read more about it at http://ascii.textfiles.com/archives/4755.

But there's a lot of those rescued manuals left to be digitized and made available online, and I think they should be, and can be. Per K6KJN's article, there is some "special deal" worked out that can expedite those remaining rescued manuals getting digitized and made available online from "approximately before the end of time" to "much sooner than that"… *if some additional, dedicated funds can be raised*.

I would like to ask the Zero Retries readership to donate to this effort, and if you've thought about becoming a paid subscriber to Zero Retries in 2024, including renewing your paid subscription, please consider donating to this project instead. Again, here is the

special donation link.

Bonus - unlike paid subscriptions to Zero Retries, a donation to Internet Archive is (US) tax deductible!

My reasoning for this request is that (from what I understand - this wasn't stated in the article or to me personally) these rescued manuals are in limbo at the moment as no one is sure if they'll be digitized "soonish" or not. If "not", I'll guess that they're going to go into a very long term queue (deep storage) and they may not get digitized and online in this, or perhaps the next, decade. That's just the reality of the way the Internet Archive has to do things given the constant influx of physical media that has been rescued from oblivion. Getting these manuals digitized and online is unglamorous, but I can easily imagine that some of them may become important at some point. Imagine some obscure piece of equipment at some vital, but pitifully funded system that Amateur Radio cares about, like WWWB, or National Weather Service, an Antarctic base, or ??? that has a piece of equipment needed repair and no one can find the old paper manual to *service* that equipment.

Again, while Zero Retries happily accepts donations in the form of paid subscriptions, I think this particular project, at this particular moment, is "the greater good" and I'll happily forego paid subscriptions to Zero Retries for a while. I chipped in for $100,and hope I'll have a lot of company in that.

One last time, here is the special donation link to help get the remainder of the "Manuals Plus" manuals digitized and made available online.

Thank you for considering this request.

73,

Steve N8GNJ

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#Hamvention2024

By Steve Stroh N8GNJ

Zero Retries Interesting developments at Hamvention 2024 this weekend in Xenia, Ohio, USA.

Photon Radio

Logo courtesy of Photon Radio

The “sleeper” development of Hamvention 2024, for me, was a subtle reference in the vendor directory to “Photon Radio” (looks inserted at the last moment, out of sequence at the end of the directory) in booth 4307:

> **Photon Radio - Tools for photon communication**
>
> Welcome to the wave particle duality of radio! We are showing off our 1Mbit per second non-wave making digital transmitter for the 160M to 30M HF bands. Work with us online or come to our radio resort in Japan to build out a new generation of high speed digital communication devices. We can supply circuit boards, kits, training and sabbatical opportunities at our beachside location.

I was finally able to click through the link in the directory to https://photonradio.com.

Oh my, this was *quite* the “though the looking glass, down the rabbit hole” experience…

> **Summary**
>
> 1. AK4VO discovered how to generate pulses of photons instead of continuous waves via direct current activation of non-resonant antennas. This allows mbit/second digital communications over the HF bands.
> 2. We can transmit bits at 800k bit/second in the 80 meter band at very low bandwidth. Our technology also can improve the clarity and speed of CW.
> 3. We can provide circuit boards and kits for HF ham bands and are looking for collaborators. Our 20-watt transmitter board transmits a programmable 128 bit message at 5, 10, 50 or 100 sine cycles per bit.
> 4. Please join our user’s group and fill out a questionnaire letting us know what kind of digital transmitter and receiver that you would like to see developed. Let`s interface a little bit with your computer!
> 5. Take a look at our publications, in hard copies here and also available at photonradio.com. Introduce yourself and tell us your arguments and objections.

I would absolutely seek out this booth for some extended conversation with Marvin Motsenbocker AK4VO. All this… sounds… wild… to me and I would have *thought* that such a technology would have been known by now.

But, we keep getting surprised1 with completely new approaches to radio technology, thus I’m more than willing to have an extended conversation. That Photon Radio seems to welcome questions, provides extended technical descriptions, and has some hardware (reportedly) available lends credence to their claims.

Zero Retries Interesting(ish) Announcements

Gleaned from the first day of Hamvention 2024 (still underway as I finish the last edits of this issue of Zero Retries)… these announcements / debuts were the most Zero Retries Interesting:

- FlexRadio 8400/M/8600/M - The big announcement from FlexRadio is a more capable high high-end family of HF radios to be available in August. This is the sort of development that rates a press release, but noting found about this new radio family at FlexRadio’s press page. Without a careful A / B parsing of older products versus these new products, I can’t really explain the substantive improvements being made in this new family. YouTube channel Kyle - AAOZ interviewed Mike VA3MW of FlexRadio, and who showed a slide that claimed the new radios had “4x increase in CPU”, and “2x increase in FPGA” and a built-in GNSS (GPS) receiver feeding a GPS Disciplined Oscillator (GPSDO) for improved frequency stability.
- EZDV Adapter for FreeDV - Units are for sale at the TAPR booth, and apparently for sale online.
- Beta of CubeSatSim *Kits* - AMSAT will be selling kits of the CubeSatSim at Hamvention. Apparently this is the first lot of kits, thus the “Beta” descriptor. This is the first time this unit has been available as a full kit of all parts. Previously, you bought the (unpopulated) printed circuit boards from AMSAT and then sourced all parts yourself, including 3D printing the structural pieces. This kit will exponentially expand the number of CubeSatSims out in the world to help evangelize Amateur Radio satellites.
- ComJot CJ-1 - “World’s First Open Source Android Radio - Android 14, DMR T1 & T2, VHF & UHF - see the video. More info at https://tait-radio.com/comjot-cj-1/
- Kenwood TH-D75A/E Operating Tips Manual - Kenwood debuted a “limited run” of hardcopies of this new manual at Hamvention 2024.
- Hamvention Full YouTube streaming for Hamvention seminars - I was impressed that Hamvention will be streaming all four Forum rooms at Hamvention, simultaneously, on Friday and Saturday. In previous years, not all of the Forum rooms / all of the presentations, were streamed, so some of the Forums that I was interested in weren’t recorded.
- Icom “X60” Box of Boards - *Barely* Zero Retries interesting, but Icom debuted a plexiglas box of boards and modules (yes, literally) with no information about what those pieces are intended for. There are some labels on the units, but I didn’t see a close up photo to even hazard a guess. A bit later I saw some close-up video and it looks like boards for an HF radio.
- Kenwood Tri-band Mobile Radio in Development - I skimmed through the first 25 minutes or so of Ham Radio Crash Course’s Hamvention Booth Tour - Day One! video and approximately 23:30 a rep in the Kenwood booth claimed that Kenwood is working on a “tri-band mobile”.

Zero Retries Interesting Commercial Vendors

From the Hamvention 2024 Commercial Booth directory, these are the vendors that I would have prioritized to visit / interview as Zero Retries Interesting:

- ADSBexchange.com
- AMSAT
- AREDN
- ARISS-USA
- Amateur Radio Digital Communications (ARDC)
- Amateur Television Network
- FIRST Robotics
- FlexRadio Systems
- Free DV
- Libre Space Foundation
- MMDVM
- NOAA - National Weather Service
- NVIS/Codan Communications Consulting
- Photon Radio
- QRP Labs
- TAPR (Tucson Amateur Packet Radio)

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ZR > BEACON

By Steve Stroh N8GNJ

Short mentions of Zero Retries Interesting items.

First Contact Made Through QO-100 from North America

Amateur Radio Daily 2024-05-12:

> The first contact through the QO-100 geostationary satellite made from North America took place on May 11th from Newfoundland, Canada. VO1/M0XUU (VU3HPF) made a trans-atlantic FT8 contact with G0MRF in London. The contact is significant considering the QO-100 footprint falls beyond Newfoundland at -0.9° below the horizon.
>
> Source: AMSAT UK

This is pretty Zero Retries Interesting! Below the horizon isn't supposed to be "possible", but it's… *radio*…, in all its weirdnesses and exceptions to the rule!

Open Source in Amateur Radio Wiki

> Dear open source hams,
>
> I was thinking that it would be a good thing to have a public wiki where (in the first step) all the ham radio related open source hardware and software projects are listed. As a second step it could contain articles that describe how to build an open source station. It further more could get more content with howtos etc.
>
> So here is a first draft:
>
> https://opensource.radio
>
> It really is only the work of few hours and far from being structured or even complete.
>
> What do you think? Is it worth the work? Would you like to contribute?
>
> I think it's impossible to do this by myself and I wonder if others would be interested to contribute.

I discovered this *brand new* project on Mastodon from https://mastodon.radio/@DK1MI. This is a worthy project.

Announcing [Amateur Radio Software Award] 2024 award recipients - Jakob Ketterl (DD5JFK) for OpenWebRX and Marat Fayzullin

(KC1TXE) for OpenWebRX+

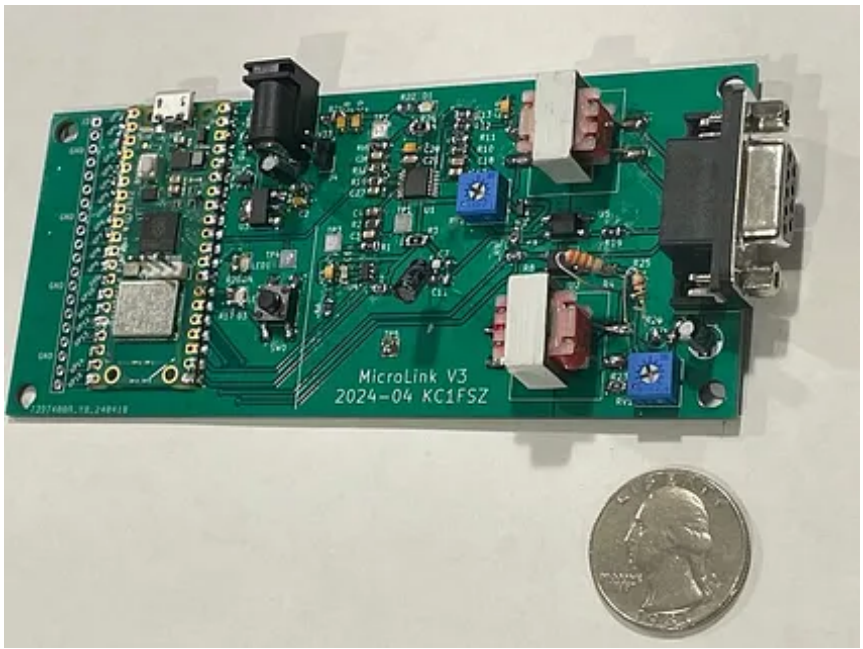
> The Amateur Radio Software Award (ARSA) committee is pleased to announce that OpenWebRX, a project led by Jakob Ketterl DD5JFK, and OpenWebRX+, a project led by Marat Fayzullin KC1TXE, have been selected as the winners of the 5th annual Amateur Radio Software Award. The award recognizes software projects that enhance amateur radio and promote innovation, freedom, and openness in amateur radio software development.
>
> …
>
> The history of these projects showcase the benefit of open source software. OpenWebRX was originally created by András Retzler but due to the demands of his career he decided to discontinue its development. Jakob Ketterl took over the OpenWebRX project and continues to maintain and improve OpenWebRX. Marat Fayzullin's OpenWebRX+ builds on top of Jakob Ketterl's OpenWebRX adding support for additional communication modes and advanced features. Both projects are currently separate allowing implementers of hosting sites to choose between the simple core version or the enhanced version without difficulties while allowing the developers to focus on their projects goals.

OpenWebRX was barely on my Zero Retries Interesting RADAR, but OpenWebRX+ was not. I'm in awe of KC1TXE's vision for OpenWebRX+:

> In a way, I view OpenWebRX+ as a real-life 'tricorder' for the radio spectrum.

My thanks to Amateur Radio Weekly Issue 330 for noting this Zero Retries Interesting story.

MicroLink Project - Open Source Implementation of EchoLink with a Microcontroller



MicroLink V3 - Image courtesy of Bruce MacKinnon KC1FSZ

> Is it possible to build a full EchoLink® node using a $6 microcontroller? I'm not completely sure, but let's find out. The goal of this project is to create the smallest, cheapest way to put a radio onto the EchoLink network. If you are new to the world of EchoLink please see the official website for complete information. EchoLink is a peer-to-peer VoIP (voice over IP) network used to link amateur radio stations across the Internet.
>
> There are much easier ways to get onto EchoLink. The MicroLink project will only be interesting to someone who wants to get deep into the nuts-and-bolts of EchoLink/VoIP technology. In fact, you should start to question the sanity of anyone who spends this much time building their own EchoLink station. I am a homebrew enthusiast and I try to avoid off-the-shelf software/components where possible. This has been a huge learning opportunity.
>
> The system currently runs on a Pi Pico W (RP204, ARM Cortex M0) board. I'm pretty sure it could also run on an ESP-32, or possibly an Arduino of sufficient caliber. More experimentation is needed here.
>
> The software is fully open source. Now that EchoLink is "open", others can experiment with this important amateur radio technology. I am currently working on adding support for AllStarLink. More to follow ...

This is a cool Zero Retries Interesting project by Bruce MacKinnon KC1FSZ. I'm in awe of his ability to write software "for bare metal" (note - *microcontroller*, so no operating system) including Voice over Internet Protocol (VOIP) and a TCP/IP stack for Internet. I said during my email correspondence:

> Cool that you're peeling back the onion of EchoLink and making it more accessible. Every time there is [an open source] project like this, it provides more "fodder" for newcomers interested in radio technology to see themselves helping create new radio things through software.

KC1FSZ noted that the GSM-0610 full rate CODEC used in EchoLink is extremely well documented and it took him "about two weeks" to implement it

for MicroLink.

KC1FSZ is also working on a VHF FM transmitter - see his QRZ page. Regarding that I said:

> I've been saying for a while now that capable receivers are now a solved problem - RTL-SDRs. Reasonable *transmitters* are the bottleneck.

My thanks to KC1FSZ for bringing this to my attention.

Ribbit Updates

Ricardo Saiz on the Ribbit-Users mailing list:

> I have installed and successfully run the linux modem https://github.com/aicodix/modem/ in a Raspberry version 1. I have left it up and working for several days. The script records sound clips from a 2 meter radio, demodulates the data, shows the message in an http server: http://ea4gmz.hopto.org/OFDM.txt and repeats the same message a few seconds later. Fellow hams around Madrid have been able to exchange messages using Rattlegram in their smartphones and a fixed or handheld radio. It works through voice repeaters too. The modem software was modified for making the algorithm faster, maybe at the expense of some sensitivity. I have not noticed a significant loss of sensitivity, and now it takes less than 100 ms to process an audio clip and decode the message, even in a Rpi 1.
>
> This is a temporary and experimental system. I wish to engage more people into Rattlegram as an introduction to Ribbit.

Pierre W4CKX on the Ribbit-Users mailing list::

> Know that Ahmet contributed Ribbit codec as an evolution of Rattlegram and that all characteristics were improved across the board. Alex has been working on a PWA for almost 2 months and we are now working on the App UX. Ribbit 1.0 beta is getting closer to release. (We are not committed to any date, it will be released when it's ready).
>
> When released, we will direct you to our ORI GitHub where you will find Ribbit codec and can update your build.
>
> Ribbit will support message metadata, user profiles, geolocation and r/channels.

Ribbit is one of the Zero Retries Interesting projects I try to cite as Amateur Radio adjacent, along with software defined receivers (RTL-SDR, SDR Play RSP1B, and KiwiSDR to name three favorites), SatNOGS, and Meshtastic, that don't require an Amateur Radio license to experiment, learn, and generally have fun with radio technology.

Teensy SDR Project

Image courtesy of Mike Lewis K7MDL

> Winter 2020-2021 I decided to build my own Arduino SDR and after looking around I found the Keith'sSDR group at keithsdr@groups.io | Home
>
> The project was focused on building a simple DIY SDR radio based on Arduino on the very capable Teensy 4 series CPU. I have been using the Teensy 4 for my RF Wattmeter/Band Decoder project, now realized in a RF tolerant PCB design. I jumped in. I was mostly software focused and wanted to create a high resolution spectrum display and commercial looking UI features primarily to perform as compact low power IF radio for my VHF and microwave transverters.
>
> I extended the KeithSDR with customizable table drive UI elements then moved onto figure a way to get a high resolution spectrum and waterfall display, eventually running at multiple FFT sizes. Today that is 1024, 2048 and 4096 both I and Q. I use multiple FFT sizes to achieve pan and zoom with no extra compute required. I also wanted the touch screen to evolve to not miss physical controls much, if at all. On the 7" 1024x600 display version I have not used hardware controls for a year.

This Zero Retries Interesting project by Mike Lewis K7MDL was discovered from a mention by the MicroHAMS Amateur Radio Club which has featured a lot of Zero Retries Interesting topics of late.

Icom IC-905 Amateur Television Capabilities Reviewed

Excerpted from Boulder Amateur Television Club TV Repeater's **REPEATER newsletter**, May, 2024, 2nd edition, Issue #162:

> **IC-905 - Icom's Microwave and ATV Transceiver, by Dave Crump G8GKQ, British Amateur Television Club**
>
> **Amateur TV Operation** --- The IC-905 will transmit and receive frequency modulated (FM) ATV pictures with a single sound sub-carrier. In the UK, this mode has gradually been replaced by digital DVB-S/S2 over the last 20 years.
>
> …
>
> **Digital ATV** --- The IC-905 only transmits and receives analogue FM ATV. It is a shame that no attempt has been made to handle DVB-S2 digital ATV which is now the predominant ATV mode in the UK and on the QO-100 satellite. As the unit has no 'IF' input or output, the only likely option for introducing this capability would be an internal firmware upgrade. Unfortunately, it is unlikely that the internal processor could handle the challenging error- correction processing required for reception, as this is usually handled in custom integrated circuits. The omission of digital ATV might preclude the use of this rig for any ATV operation in the 1296MHz band following the possible future implementation of restrictions to safeguard radio-navigation satellite services (RNSS).
>
> …
>
> **Conclusion** --- I am really pleased that Icom have brought this microwave/ATV transceiver to market. It can only serve to stimulate interest in these aspects of the hobby. It is a polished, capable unit; however, it is not a good fit for the current UK ATV scene - it would have been perfect 20 years ago. Despite the lack of flexibility, I would love to own one, but the price puts me off: £3549.95 for the basic system and another £1499.99 for the 10 GHz transverter.

Not being an active Amateur Television user, I felt I didn't have much standing for an opinion on that capability of the IC-905. But this review by experienced ATV user G8GKQ validates my initial impressions of the television capabilities of the IC-905:

- *Analog* television?
- In a *brand-new (2022)* high end VHF / UHF / Microwave Amateur radio?
- Only accepts *analog* (not USB) video signals / cameras?

I thought that FM ATV was a neat capability of the IC-905… *if it had been released two decades, or even a decade ago*. But the advanced Amateur Radio Television folks (especially as documented by the BATVC newsletter this is excerpted from) have *long* since migrated to using *digital* television technologies. Thus the IC-905 loses a bit of its luster in not incorporating that "state of the present" standard for Amateur Television.

A Transport Protocol's View of Starlink

From The ISP Column - May 2024 by Geoff Huston:

> Digital communications systems always represent a collection of design trade-offs. Maximising one characteristic of a system may impair others, and various communications services may chose to optimise different performance parameters based on the intersection these design decisions with the physical characteristics of the communications medium. In this article I'll look at the Starlink service [1], and how TCP, the workhorse transport protocol of the Internet, interacts with the characteristics of the Starlink service.
>
> …
>
> The Starlink satellite's Ku-band downlink has a total of 8 channels using frequency division multiplexing. Each channel has an analogue bandwidth of 240Mhz. Each channel is broken into frames, which is subdivided using time division multiplexing into 302 intervals, each of 4.4μs, which together with a frame guard interval makes each frame 1,333μs, or 750 frames per second. Each frame contains a header that contains satellite, channel and modulation information [6]. The implication is that there is a contention delay of up to 1.3ms assuming that each active user is assigned at least one interval per frame.
>
> This leaves us with four major contributory factors for variability of the capacity of the Starlink service, namely:
>
> - the variance in signal modulation capability, which is a direct outcome of the varying SNR of the signal,
> - the variance in the satellite path latency due to the relative motion of the satellite and the earth antennae,
> - the need to perform satellite switching on a regular basis, and
> - the variability induced by sharing the common satellite transmission medium with other users, which results in slot contention.

I thought this was a fascinating, reasonably high level explanation of *just how sophisticated the radio technology has to be* for Starlink to be a usable, let alone reasonably high bandwidth system for Broadband Internet Access. The levels of dynamic variables to take into account are just staggering (to me).

OL-SDR - HF 1.8-50MHz 2 Channels SDR Transceiver

> OL-SDR represents the pinnacle of innovation in the field of SDR radios, offering unrivaled sophistication and flexibility. Just look at its rear panel, which offers a wide range of connections and functionality, embodying the complexity and power behind this extraordinary technological solution.
>
> With an internal structure centered around a next-generation FPGA, OL-SDR is distinguished by unprecedented versatility and control. This extreme adaptability and operational precision position it as a versatile transceiver in a diverse range of high-demand operating contexts, where the need for extreme performance is critical.

> Its internal architecture and advanced external interface are designed to meet the most demanding needs of the most sophisticated operators. OL-SDR is an ideal option for those who require maximum customization and flexibility, offering a level of functionality adaptable to a wide range of specialized applications.
>
> **Here are some of the key features of the OL-SDR:**
>
> - Unrivaled sophistication and flexibility: The OL-SDR is packed with features that make it the most sophisticated and flexible SDR radio on the market.
> - Wide range of connections and functionality: The OL-SDR's rear panel offers a wide range of connections and functionality, making it ideal for a variety of applications.
> - Next-generation FPGA: The OL-SDR is powered by a next-generation FPGA, which provides unprecedented versatility and control.
> - Extreme adaptability and operational precision: The OL-SDR is designed for extreme adaptability and operational precision, making it ideal for high-demand operating contexts.
> - Advanced external interface: The OL-SDR's advanced external interface is designed to meet the most demanding needs of the most sophisticated operators.
> - Maximum customization and flexibility: The OL-SDR offers a level of customization and flexibility that is unmatched by any other SDR radio.

I'm not remotely qualified to vet these claims, but it looks like Olliter Laboratory (Italy) wants to give FlexRadio some significant competition. I'm surprised that new companies like this see the market for high-end Amateur Radio HF radios as significant enough to invest into, even if such products are used as a steppingstone to commercial / government sales.

M.2 HAT+ for Raspberry Pi 5 Now Available

> The Raspberry Pi M.2 HAT+ enables you to connect M.2 M-key peripherals, such as NVMe drives and AI accelerators, to your Raspberry Pi 5. It provides fast (up to 500 MB/s) data transfer to and from these peripherals, and is available to buy today, from our network of Approved Resellers, priced at just $12.
>
> Raspberry Pi 5 launched back in September last year with an exciting new feature on board. No, not the power button. Or the battery-backed real-time clock. We're talking about the PCI Express (PCIe) expansion connector: this small 16-way FFC (flexible flat cable) connector, positioned at the extreme left of the board where the MIPI display connector lives on older Raspberry Pi boards, carries a single-lane (one transmit pair, one receive pair, and one clock pair) PCIe 2.0 bus.

To me, the M.2 HAT+ completes the Raspberry Pi 5 as an appliance computer. Using a MicroSD card for "disk" storage, even a "hardened / industrial" unit was widely viewed as reasonable for hobbyists, but not really reliable. With this, Raspberry Pi 5s can use Solid State Drive (SSD) modules directly for higher reliability and performance.

KE9V - The Future is Here

Zero Retries Pseudostaffer and Guest Author Jeff Davis KE9V:

> Just a week ago I wrote about the rapidly changing future for amateur radio emergency services due to the growth of wireless internet access provided by the Starlink service and its fleet of low-earth orbit satellites. Then came dangerous flooding in remote parts of Brazil. Did amateur radio send in the *varsity squad* to provide communication help? No. But a thousand Starlink terminals were sent to facilitate needed comms in the worst hit areas.
>
> …
>
> Still, it's a major shift in communication technology and one that hams shouldn't ignore. The last thing we need is to appear to be a bunch of sour old men waving our handhelds at the heavens and cursing the magic of internet service being delivered from space. We need to find a way to use this paradigm shift to our advantage (if we want to continue hitching our wagon to EMCOMM) and that will likely take the form of using what we're good at, radio, to fill in the gaps that will invariably appear in any such technology-based solution.

I came to this conclusion last summer with my (Starlink) Meadow Day experiment.

New Zero Retries Interesting Item in the Ham Radio Outlet Catalog

The top half of Page 32 of the Spring Summer 2024 HRO catalog featured a new Zero Retries Interesting device - **digirig**. I don't recall seeing digirig in previous versions of the HRO catalog. I've mentioned digirig numerous times in Zero Retries as a compact, well-engineered audio interface (modem) for Amateur Radio data communications, ideal for use with portable radios. It's impressive that digirig has achieved sufficient scale to be featured in the HRO catalog and have the margins to be sold via a retailer.

And… it was interesting to note what *wasn't* in this edition of the HRO catalog - Tigertronics SignaLink USB units. A quick check of the HRO website for "tigertronics" shows 34 items so apparently SignaLink USBs are still being sold through HRO.

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Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out
Join the Fun on Amateur Radio for some pointers.

Zero Retries Frequently Asked Questions (FAQs) — In development 2023-02.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with radio technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to everyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing ***Thanks*** to:

- Tina Stroh KD7WSF for, well, *everything!*
- ***Founding Members*** **who generously support Zero Retries financially:**
  Founding Member 0000 - Steven Davidson K3FZT
  Founding Member 0001 - Prefers to Remain Anonymous 01

  Founding Member 0002 - Chris Osburn KD7DVD
  Founding Member 0003 - Don Rotolo N2IRZ
  Founding Member 0004 - William Arcand W1WRA
  Founding Member 0005 - Ben Kuhn KU0HN
  Founding Member 0006 - Todd Willey KQ4FID
  Founding Member 0007 - Merik Karman VK2MKZ
  Founding Member 0008 - Prefers to Remain Anonymous 14
  Founding Member 0009 - Prefers to Remain Anonymous 19
- Numerous Annual and Monthly subscribers who also generously support Zero Retries financially!

Want to Support Zero Retries?

- The *most* effective way to support Zero Retries is to simply mention Zero Retries to your co-conspirators that are also interested in knowing more about technological innovation that is occurring in Amateur Radio and encourage them to become a fellow subscriber.
- One particularly effective method of promoting Zero Retries is to add a mention of Zero Retries to your QRZ page (or other web presence) and include a link:

  https://www.zeroretries.org
- If you'd like to financially support Zero Retries, becoming a paid subscriber is *greatly* appreciated and helps offset expenses incurred in publishing Zero Retries. Paid subscriptions for Zero Retries are *entirely optional*, as explained in this special issue of ZR:
  Zero Retries Administrivia - Activating Payment Options.

These blogs and newsletters regularly feature Zero Retries Interesting content:

- Dan Romanchik KB6NU mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- Jeff Davis KE9V also mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- Amateur Radio Weekly by Cale Mooth K4HCK is a weekly anthology of links to interesting Amateur Radio stories.
- Experimental Radio News by Bennet Z. Kobb AK4AV discusses (in detail) Experimental (Part 5) licenses issued by the US FCC. It's a *must-read-now* for me!
- RTL-SDR Blog - *Excellent* coverage of Software Defined Radio units.
- TAPR Packet Status Register has been published continuously since 1982.
- Other Substack Amateur Radio newsletters recommended by Zero Retries.

These YouTube channels regularly feature Zero Retries Interesting content:

- HB9BLA Wireless by Andreas Spiess HB9BLA
- KM6LYW Radio by Craig Lamparter KM6LYW (home of the DigiPi project)
- Modern Ham by Billy Penley KN4MKB
- Tech Minds by Matthew Miller M0DQW

Zero Retries is currently using the Substack email publishing platform to publish Zero Retries. It's particularly suitable for small newsletters as you can

get started for no cost.

If you're reading this issue on the web and you'd like to see Zero Retries in your email Inbox every Friday afternoon, just click below to join ***1600+*** other subscribers:

Subscribe now

Please tell your co-conspirators about Zero Retries — just click:

Share Zero Retries

Offering **feedback or comments** for Zero Retries is equally easy — just click:

Leave a comment

If you're a fellow smart person that uses **RSS**, there *is* an **RSS feed for Zero Retries**.

Social Media:

Zero Retries (N8GNJ) is on Mastodon — n8gnj@mastodon.radio — just click:

Zero Retries / N8GNJ on Mastodon

Zero Retries (N8GNJ) is also on Bluesky — @n8gnj — just click:

Zero Retries / N8GNJ on Bluesky

Email issues of Zero Retries are "instrumented" by Substack to gather basic statistics about opens, clicking links, etc.

More bits from Steve Stroh N8GNJ:

- SuperPacket blog — *Discussing new generations of Amateur Radio Data Communications — beyond Packet Radio (a precursor to Zero Retries)*
- N8GNJ blog — *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs — Bellingham, Washington, USA*

Thanks for reading!
Steve Stroh N8GNJ / WRPS598 (He / Him / His)
These bits were handcrafted (by a mere human, not an Artificial Intelligence bot) in beautiful Bellingham (The City of Subdued Excitement), Washington, USA, and linked to the Internet via **Starlink *Satellite* Internet Access**.

2024-05-17

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1

I vividly remember the same sensation of wonder when advanced radio technologies like digital processing gain (*thank you once again KA9Q*), spread spectrum, ultrawideband, OFDM, and cognitive antennas were all (very patiently) explained to me for the first time.